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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/528,837	03/23/2005	Akira Yamauchi	0095/023001	3753

22893 7590 11/02/2007

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EXAMINER	
ABOAGYE, MICHAEL	
ART UNIT	**PAPER NUMBER**
1793	

MAIL DATE	DELIVERY MODE
11/02/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/528,837	YAMAUCHI, AKIRA	
	Examiner	Art Unit	
	Michael Aboagye	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 August 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) *24 and 25* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02/23/2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *3/23/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group I: claims 1-23 without traverse, filed on August 07, 2007 is acknowledged.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-3,8 -11, 13-15,19 and 21are rejected under 35 U.S.C. 102(e) as being anticipated by Suga et al. (Pub. No. US 2003/0164396).

Regarding claims 1,10,11, Suga et al. teaches a bonding apparatus for bonding objects to be bonded each having a metal bonding portion on a surface of a substrate (See, abstract), comprising: a cleaning chamber (6, figure 1); cleaning means (3, figure 1) for irradiating energy waves to bonding surfaces of said metal bonding portions in said cleaning chamber under a reduced pressure condition (paragraph [0011]); bonding means (4, figure 1) for bonding said metal bonding portions of taken out from said cleaning chamber in atmospheric condition where no vacuum condition is applied; and carrying means (5, figure 1) for carrying the objects to be bonded, wherein the carrying means ensures at least a carrying-in direction to said cleaning chamber and a carrying-out direction from said cleaning chamber (see, paragraph [0023]), (note the robotic

transfer means is operable in moving the objects to and fro the cleaning chamber and transferring to the bonding station (see, paragraph [0026] and paragraphs [0027]-[0028]). (Note the applicant's invention hinges on no vacuum condition in the bonding station to expedite the bonding process and to increase through-put, that it requires a long time in setting a predetermined vacuum degree in the bonding station (see, applicant's specification 3rd paragraph; Suga et al. also teaches a bonding station requiring no vacuum condition, see paragraph [0011])

Regarding claim 2, Suga et al. teaches carrying means having a tray capable of placing thereon a plurality of objects to be bonded 9pragraph [0026]).

Regarding claim 3, Suga et al. teaches, wherein a carrying-in port and a carrying-out port for said tray of said cleaning chamber are constructed as a common port (note, the carrying means with the trays and the cleaning chamber as shown in figure 1 forms a single port or confinement).

Regarding claims 8 and 9, Suga et al. teaches a robotic carrying means which perform both functions of carrying the object to and fro the cleaning chamber and the trays are capable of holding a plurality of at a time (see, paragraph [0026])

Regarding claims 13-15, Suga et al. a cleaning means comprising means for irradiating plasma (3, figure and paragraph [0027]); comprising an Ar plasma irradiating means, paragraph [0029]) and a bonding means comprising a heating means (heater 47, figure 6, and paragraph [0041]).

Regarding claim 19, Suga et al. teaches an inert gas or a non-oxidizing gas locally provide in the cleaning chamber, the transfer portion and also the bonding station (paragraphs [0029] and [0034]).

Regarding claim 21, Suga et al. teaches a cleaning means for irradiating energy waves at an energy capable of etching said bonding surfaces over the entire sputtering surfaces at a depth of 1.6 nm or more (notes in paragraph [0027], Suga et al. teaches using plasma, an ion beam, an atomic beam a radical beam or laser which are all high energy beams capable of sputter etch to such depth).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 4 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suga et al. (Pub. No. US 2003/0164396) as applied to claim 1 above and further in view of Suga et al. (Pub. No. US 2003/0168145).

Suga et al. does not expressly teach an object carrying-in port and carrying-out port for the cleaning chamber are constructed separately from each other, a cleaning chamber sealed between the carrying-in and the carrying out portions of the conveying means.

Suga et al. a bonding apparatus for bonding objects to be bonded each having a metal bonding portion on a surface of a substrate, teach an object carrying-in port and carrying-out port for the cleaning chamber are constructed separately from each other, a cleaning chamber sealed between the carrying-in and the carrying out portions of the conveying means (see, figure 1 of Suga et al. '145, the shutter means 11 and 13, seal

the carrying-in port and the carrying-out port respectively and there are separate; said shutter operable to regulate communication between the cleaning chamber and the bonding chamber to maintain predetermined or desirable atmosphere therein (see, Suga et al. '145, figure 1 and paragraph [0030]). Suga et al. '145 also teaches a preparation chamber attached and arranged between the cleaning chamber and the bonding station (see, Suga et al. '145, figure 1).

It would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to modify the apparatus of Suga et al. '396, to include separate object carrying-in port and a carrying-out port as taught by Suga et al. '145, to regulate communication between the cleaning chamber and the bonding chamber to maintain predetermined or desirable atmosphere therein (see, Suga et al. '145, figure 1 and paragraph [0030]).

6. Claims 5, 7,16,17, 20, 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suga et al. (Pub. No. US 2003/0164396) as applied to claim 1 above and further in view of Ulner et al. (US Patent No. 6,468,833).

Suga et al. does not expressly teach a conveyor type carrying-in and a carrying-out means and an ultrasonic bonder.

Ulner et al. teaches a bonding apparatus for bonding objects to be bonded each having a metal bonding portion on a surface of a substrate, comprising an ultrasonic bonder (Ulner et al., column 5, lines 30-35); objects formed of gold (Ulner et al., column 6, lines 25-31); conveyor type carrying-in and a carrying- out means ((22) Ulner et al., column 7, lines 39-52 and figures 1 and 2). Note said conveyor is interpreted by the

examiner as a carrying tape and the belt of said conveyor is capable of sagging or tensioned up. Ulner et al. also teaches a bonding tool selected from one of thermosonic bonding, ultrasonic bonding, compression bonding, wire bonding, solder bump bonding, or a combination of same (Ulner et al., column 8, lines 41-52). (Not, pressing means recited in claim 16 is met, because at least one of these bonding tools comprises a pressing means). Regarding the dispersion gap, recited in claim 22, the examiner believes the bonding means of Ulner et al. is necessarily capable of producing a dispersion gap of 4 microns or less, because Ulner et al. teaches the same bonding tool as applicant (ultrasonic wave bonder), an teaches an same material constituent of the object to be bonded (i.e. gold), With respect to claim 23, teaching of Ulna et al. and same argument is relied upon, and furthermore hardness is an intrinsic material property.

It would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to modify the apparatus of Suga et al. '396 to use a conveyor type carrying-in and a carrying- out means as taught by Ulner et al. to ensure effective and appropriate transport of the objects to be bonded through internal space while isolating them from the surrounding atmosphere (Ulner et al., column 43-48).

7. Claims 6 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suga et al. (Pub. No. US 2003/0164396) as applied to claim 1 above and further in view of Suga et al. (Pub. No. US 2003/0168145) and Ulner et al. (US Patent No. 6,468,833).

Suga et al.'396 and Suga et al.'145 combined teach sealing the carrying-in port and a carrying-out port from each other but do not expressly teach a conveyor type carrying-in and a carrying- out means.

Ulner et al. teaches a bonding apparatus for bonding objects to be bonded each having a metal bonding portion on a surface of a substrate, comprising an ultrasonic bonder (Ulner et al., column 5, lines 30-35); objects formed of gold (Ulner et al., column 6, lines 25-31); conveyor type carrying-in and a carrying- out means ((22) Ulner et al., column 7, lines 39-52 and figures 1 and 2). Note said conveyor is interpreted by the examiner as a carrying tape and the belt of said conveyor is capable of being sagging or tensioned up.

It would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to modify the combines apparatus of Suga et al. '396 and Suga et al.'145 to use a conveyor type carrying-in and a carrying- out means as taught by Ulner et al. to ensure effective and appropriate transport of the objects to be bonded through internal space while isolating them from the surrounding atmosphere (Ulner et al., column 43-48).

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Nakao et al. (US 5188280), Miura (US 5898214) and Yamauchi (US Pub. 2004/0007312) are also cited in PTO-892.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Aboagye whose telephone number is 571-272-8165. The examiner can normally be reached on Mon - Fri 8:30am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jonathan Johnson can be reached on 571-272-1177. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AM

JONATHAN JOHNSON
PRIMARY EXAMINER

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Art unit 1793
10/27/2007